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## MECHANICS.

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89. Proposed by GUY B. COLLIER, Schenectady, N. Y.

Assuming that the Northern Pacific R. R. tracks between Fargo and Bismark (North Dakota) to lie on the 47th parallel of latitude; also that the Limited Express weighs 300 tons, and that a speed of 60 miles per hour is maintained between the two places; find the difference between the vertical pressures on the rails of the Express east and the Express west.

90. Proposed by WALTER H. DRANE, Graduate Student, Harvard University, Cambridge, Mass.

Adopting the hypothesis that the planets were originally all one mass revolving about a fixed center and were formed by an explosion of this mass at some point in its path; prove that, if the law of nature were that force varies directly as the distance, the planets would all have collided again simultaneously, and find an expression for the time between the explosion and collision.

\*\*\* Solutions of these problems should be sent to B. F. Finkel not later than June 10.

## DIOPHANTINE ANALYSIS.

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80. Proposed by M. A. GRUBER, A. M., War Department, Washington, D. C.

Find three square numbers whose reciprocals form an arithmetical progression.

\*\*\* Solutions of this problem should be sent to J. M. Colaw not later than June 10.

## AVERAGE AND PROBABILITY.

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73. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Mathematics and Science, Chester High School, Chester, Pa.

On an average 1 vessel out of every  $n$  is wrecked. Find the chance that out of  $m$  vessels expected  $p$  at least will arrive safely.

74. Proposed by F. ANDEREGG, A. M., Professor of Mathematics, Oberlin College, Oberlin, Ohio.

From a point in the circumference of a circular field a projectile is thrown at random with a given velocity which is such that the diameter of the field is equal to the greatest range of the projectile. Find the chance of its falling into the field. [From Byerly's *Integral Calculus*, page 209].

\*\*\* Solutions of these problems should be sent to B. F. Finkel not later than June 10.

## MISCELLANEOUS.

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77. Proposed by T. E. COLE, Columbus, Ohio.

It is said that a base-ball pitcher throws curves. Give a scientific explanation of how it is done.

78. Proposed by WALTER H. DRANE, Graduate Student, Harvard University, Cambridge, Mass.

The center of a regular polygon of  $n$  sides moves along a diameter of a given circle, the plane of the polygon being perpendicular to the diameter, and its magnitude varying

in such a manner that one of its diagonals always coincides with a chord of the circle; find the surface and the volume generated, and thence deduce the formulæ for the surface and the volume of a sphere.

\*\*\* Solutions of these problems should be sent to J. M. Colaw not later than June 10.

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## EDITORIALS.

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Editor Finkel was elected a member of the London Mathematical Society on April 13th.

THE UNIVERSITY OF CHICAGO, SUMMER, 1899. The following Mathematical Courses will be offered: By Professor *Maschke*, Theory of Functions of a Complex Variable, Abstract Groups; Professor *Hathaway*, Quaternions, Plane Analytics; Assistant Professor *Young*, Conferences on the Pedagogy of Mathematics, Determinants; Assistant Professor *Skinner*, College Algebra; Dr. *Slaught*, Differential Equations, Differential Calculus; Dr. *Boyd*, Twisted Curves, Solid Geometry.

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## BOOKS.

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*An Introduction to the Differential and Integral Calculus and Differential Equations.* By F. Granville Taylor, M. A., B. Sc., Mathematical Lecturer at University College, Nottingham. 8vo. Cloth, 592 pages. Price, 8s. London and New York: Longmans, Green & Co.

This work comprises three sections, in the first of which is given a very thorough treatment of the Differential Calculus and its applications; the second is devoted to treatment of the Integral Calculus; and the third deals with the elementary methods of solving Ordinary Differential Equations of the first and second orders. In the Differential and Integral Calculus, the author has given a few practical applications as early as possible, in order that the beginner may have some notion of the uses to which the Calculus may be put. Curve Tracing receives a good deal of attention; Hyperbolic Functions and their differentiation has received due consideration. Throughout the work, numerous examples are given, these being well selected and graded in a way to stimulate and inspire the student. The subject of the Calculus as presented in this work is clear and simple, and is a worthy rival of the many valuable works on this subject. B. F. F.

*A Text-book of General Physics* for the use of Colleges and Scientific Schools. By Charles S. Hastings, Ph. D., and Frederic E. Beach, Ph. D., of Yale University. 8vo. Half Leather Back, v+768 pages. Price, \$2.95. Boston: Ginn & Co.

In this book, the fact is emphasized that a knowledge of Elementary Mechanics is the logical basis of the whole science of Physics. With this in view, we find here a more complete treatment of Mechanics than is ordinarily the case, especially in the physical notions which attach to the simplest cases of the action of force. Numerous problems are appended to the various chapters, the solutions of which will go far towards impressing the principles upon the mind of the student. The method of presenting the subject of Physics as here given is very good. B. F. F.